Like most scientists of his time, Lomonosov expected that all planets had life on them and therefore needed atmospheres to nurture that life, so he was inclined to report that he had discovered an atmosphere. Most of his article was philosophical in nature. The fact that he didn't actually have observations to back the correct conclusion does not diminish his achievement as one of the most important scientists of his time, and it would only dim his luster to credit him with discoveries that he didn't make.

References

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2. J. M. Pasachoff, G. Schneider, T. Widemann, *Astron. J.* **141**, 112 (2011).

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■ **Shiltsev replies:** The criticism of Jay Pasachoff and William Sheehan does not appear well founded. First, besides Mikhail Lomonosov, who was the first to recognize and explain the aureole around Venus, several other astronomers had seen it, too, during the 1761 and 1769 transits. The 18th-century images of the "Lomonosov arc" do not have the resolution of those taken nowadays from space satellites, but neither do most of the images that were taken by ground-based telescopes battling our atmosphere during the transits of the late 19th century, 2004, and 2012.

Also, I think the proportion of Lomonosov's paper that was devoted to the observations is perhaps a red herring. That he wrote 5 out of 16 pages placing his results in the intellectual context of his day is a testament to his abilities as a natural philosopher; the plurality of worlds was as hot a topic then as it is in our age of exoplanet research.

To address the skepticism, my colleagues and I experimentally replicated Lomonosov's discovery during the transit of Venus on 5–6 June 2012. A thin arc of light on that part of Venus off the Sun's disk during the ingress was successfully detected with original 18th-century Dollond achromatic refractors similar to the one deployed by Lomonosov and with his experimental techniques carefully emulated.[1] Simultaneous observations with high-quality modern doublet refractors revealed the aureole, too, and demonstrated that today's telescopes do not significantly outperform the earlier instruments.[2]

References

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Let's not call it the 'God particle'

Calling the Higgs boson the "God particle" is a mistake that we need to avoid.

Science is under serious and increasingly successful attack in the US by religious extremists who are concerned mainly with the teaching of biological evolution in public schools but are also generally anti-science and anti-intellectual. The majority of Americans have some religious beliefs that are important to them. I have been speaking to various churches, social clubs, and other groups, trying to explain to them what science is about; why science, correctly understood, does not threaten most people's religions; and why we can't afford to teach anything but the best science we know in our schools. I'm not trying to convert extremists. I'm trying to arm reasonable, mostly intelligent but uninformed people against simplistic arguments like "It's only a theory" or "Why not teach all sides?" They listen to me because I respect their religious beliefs even though I don't share them. They tune out scientists who offend their religious sensitivities.

We need such people to be our allies. Offending them by using "God" flippantly is just throwing gasoline on a fire. It's encouraging a fight we cannot win, and we should stop doing it.

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Correction

July 2012, page 47—The sentence beginning four lines below equation 3 should read, "The so-called likelihood function $P(data|param)$ is, in fact, simply the probability of seeing the observed data if a specific parameter value is the true one." ■